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Surface Water Quality Bureau Sponsors Forest Thinning Projects in the Gila Region

By David Menzie

The heavy erosion resulting from the loss of vegetation that accompanies wildfires drastically increases sedimentation in streams within burned watersheds. The elevated sediment loads result in severe damage to riverine ecosystems, with effects ranging from asphyxiating fish by clogging gills to filling interstitial spaces in stream substrates, which results in macroinvertebrate habitat loss.

The New Mexico Environment Department Surface Water Quality Bureau (SWQB) is administering four Clean Water Act §319(h) projects that are designed to mitigate the effect past land management policies that have contributed to the potential for catastrophic wildfires in the Upper Gila, Upper Gila-Mangas, San Francisco, and Mimbres watersheds.

The four CWA §319(h) projects are: Upper Mimbres River Water Quality Improvement project, Gila National Forest Watershed project, Cedar Breaks Watershed Improvement project, and Mangas Water Quality Improvement project, all located in the Gila National Forest (GNF). The GNF areas were selected for implementation of best management practices (BMP) because they are dominantly public lands with grazing allotment permittees that indicated a willingness to participate in these kinds of projects. These projects also presented a solid opportunity to reduce nonpoint source stream pollution originating from the uppermost parts of the watersheds where the public lands are located.

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Research indicates that prior to widespread logging, grazing, and fire suppression activities, fire was a key factor in the ecology of many western forests. It has also been found that there is a reasonable connection between watershed-wide changes to the vegetative state and subsequent changes to watershed runoff and sediment transport characteristics. Natural, frequent wildfires



Special equipment used to thin small diameter trees funded under the Upper Mimbres Water Quality Improvement Project. Although all the grant funds have been expended and the project officially closed, the Gila National Forest continues to use this piece of equipment and prescribed fire to thin the forest in the upper Mimbres watershed.

served the function of cleaning up deadfall and other fuels that accumulate on the forest floor, releasing nutrients more slowly than catastrophic wildfires, and thus building soils. Historic logging, grazing, and land management practices all contributed to the loss of frequent low-intensity fires. Over-utilization by grazing of the grasslands eliminated fine fuels that carried the

frequent fires. Old growth logging allowed for easier establishment of dog-hair thickets of ponderosa pine and encroachment of piñon/juniper in areas historically characterized by scattered large ponderosa pine and grassland savannas. Suppression of frequent fires appeared to be the proper policy to protect the public, protect the rangeland grasses for grazing activities, and to protect large trees valuable for logging. Instead they have led to greater danger to the public from catastrophic wildfires, loss of productive grassland by piñon/juniper encroachment, establishment of forests thick with small-diameter trees offering little commercial value, and significant changes in the his-

toric vegetative state of the watersheds .

Project goals were aimed at long-term improvement of water quality through forest management practices affecting fire ecology and grazing issues. The impacts from past land management activities in these upper watersheds include:

- excessive sedimentation from uplands erosion due to changes in vegetation arising from historical over-grazing and logging practices;
- degradation of streambanks and riparian resources from large floods common after significant changes to the upland vegetation communities and after catastrophic wildfires; and
- nutrient loading from cattle grazing and catastrophic wildfires.

These projects involve the application prescribed burning and mechanical thinning BMPs. Forest burning and mechanical thinning are upland



View of the pre-prescription black line burn in the Fort Bayard area conducted in the fall of 2002. Tasks like black line burns, burn plans, and pre-burn monitoring transects must be in place prior to conducting the prescribed burn. The prescribed burn for the Fort Bayard area is scheduled for late spring or early summer of 2003.

watershed activities designed to address past land management policies that changed the fundamental properties

of runoff and sediment transport in some western forests . Prescribed fires and mechanical thinning have

been conducted in areas where piñon and juniper are encroaching into historical ponderosa parks and grassland areas. Changes to grazing practices, such as those initiated in the upper Mimbres watershed, will also be implemented. *continued on page 3*

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These changes included creating riparian pastures and significantly decreasing the total number of cattle grazing permits in the upper watershed. Additional components of some of the projects include riparian pole planting to stabilize streambanks degraded by grazing and destructive floods, development of upland watering sources, and construction of sediment retention structures to capture fine sediment.



*One of several prescribed burns conducted in Water Canyon.
(Gila National Forest Image.)*

For additional information regarding these projects contact the staff at the SWQB Silver City Field Office, 910 E. 32nd Street, Silver City, New Mexico 88061, (505) 388-0599.

Upper Mimbres River Water Quality Improvement Project (FY1996-H) Project Officer David Menzie
Gila National Forest Watershed Project (FY2000-G) Project Officer David Menzie
Cedar Breaks Watershed Improvement Project (FY2001-C) Project Officer Dan Claypool
Mangas Water Quality Improvement Project (FY2001-I) Project Officer Mike Matush

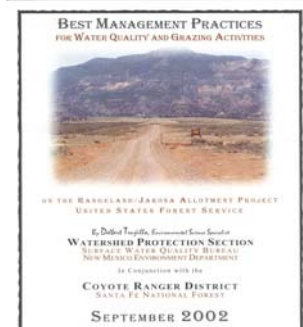
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Document Available about Best Management Practices on Rangeland

In 1998, the Watershed Protection Section awarded the Jarosa/Rio Puerco Riparian-Rangeland Improvement Project workplan to the Coyote Ranger District of the Santa Fe National Forest. The workplan committed various best management practices (BMP) for the improvement of water quality on the Jarosa Allotment. The BMPs included the construction of Trick Tanks, Fencing, Earthen Dams, and Cattle Guards. These structures will serve to improve the range management of the Jarosa allotment, which will help to improve and protect the water quality integrity of the Rio Puerco de Chama, Jarosa Creek, and the Rito Redondo watershed.

The 2002 winter issue of *Clearing The Waters* contains an article related to the best management practices implemented in the Project. Due to the many requests from the general public in retrieving information regarding this project, the Watershed Protection Section decided to integrate the Jarosa allotment BMPs into a document explaining the implementation process. The Watershed Protection Section hopes that this document will help explain the process of BMP implementation to those who seek to protect water quality in watersheds pertaining to range management practices.



For a copy of “**BEST MANAGEMENT PRACTICES, For Water Quality and Grazing Activities on the Rangeland/Jarosa Allotment Project United States Forest Service**,” contact the Watershed Protection Section of SWQB at (505) 827-0187 or log onto <http://www.nmenv.state.nm.us/swqb/Watershed_Protection/BMPs/BMPs_on_the_Jarosa_Allotment_Project.pdf>. For further information regarding structure implementation contact Delbert Trujillo at (505) 827-2867.

A Successful Approach to Forestry Management in the Gallinas Watershed

By Nina Wells

Photos by Las Vegas Ranger District

Forestry management has been under extreme scrutiny in the past 10 years in the southwest because of the catastrophic wildfires that have occurred. This has been the result of approximately 50 years of fire suppression, insect and disease damage, and tree stand overgrowth.

Many of our upper watersheds have their origins in high elevation, forested terrain. Water quality at many of these places is listed in the *State of New Mexico Standards for Interstate and Intrastate Surface Waters* (20.6.4NMAC) as high quality, cold-water fisheries. These streams are held as “pristine” waters in many cases. In the event of a catastrophic wildfire, water quality conditions are immediately at risk. Vegetation, which serves to keep soil in place, as well as filter sediment is destroyed and the creation of hydrophobic soils due to high fire temperatures all result in a massive discharge into streams and rivers. In turn, the ecology as well as the morphology of streams are negatively affected.

To prevent wildfires, especially during drought years, fuels are removed. This can be done through thinning of trees by using large mechanical equipment such as tractor mounted hydraulic clippers or by using a chainsaw; followed by prescribed cool surface fires, which can break up the organic material and recycle nutrients into the soil. In areas with a high concentration of homes, an alternative to fire is mulching the slash material after thinning.

In 1999, the Pecos/Las Vegas Ranger District was awarded a Clean Water Act §319(h) grant to provide economic assistance to address issues that have contributed to nonpoint source pollution. This project addressed problems associated with recreation sites, road closures, spring enhancement/protection, and forestry management. The area targeted for forestry

management was treated first by thinning trees, following the region forest service goshawk prescription. This style of thinning left trees of various ages but removed the ladder fuel that allows for increased fire potential. The cut material was made available to the public for personal use for one season. Planned burns were to occur afterwards to remove the slash. The prescribed burn was a finalization of the management that had started in 2000, but because of drought conditions did not occur until January 2003.

I was invited to participate in the prescribed burn at Johnson Mesa in the Upper Gallinas watershed near Las Vegas, New Mexico. This watershed provides most of the municipal water for the City, and would be severely impacted if a catastrophic fire were to occur in the upper watershed. The Viveash Fire of 2000 consumed 29,000 acres, 1800 of which were in the Gallinas River watershed. The burn on this side of the range was moderate temperature.

Optimum conditions for a successful burn include low humidity, high temperature, low soil and fuel moisture, and winds at speeds high enough to carry the burn. However, as has been documented, lighting a fire during a drought similar to that of the 2002 summer and fall months with all the mentioned factors could and has resulted in catastrophic wildfire.

In January, after several months of low to no precipitation, the Fire Management staff made the decision to burn the fuel material on three hundred acres that had been thinned. Due to the undesirable conditions, they mobilized early with the assistance of the Espanola Ranger District and the Tierra Y Montes Soil and Water Conservation



District (TyM SWCD). The first objective was to put in a fireline. (See left picture.) The day before

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the fire was to begin they opened a line on the ground that was bare of vegetation to create the firebreak back line. This line was adjacent to a private property fence. The fire was started here

and the crew, using drip torches (torches filled with diesel used to start the fuel burning), continued on this line using the wind to move the fire.

*Ignition boss,
Thomas Gonzales.*



Leading edge of fire.

if necessary. As the day progressed and the temperature increased the fire picked up momentum. The Districts' fire staff had previously identified areas to be protected, i.e. archeological sites. An archeological site required that staff do a back burn, so that when the main front of the fire came through, the site itself did not burn. Although ambient air temperatures never reached 40° F, the fire built its own momentum and consumed much of the slash fuel on the ground.



Cool surface burn.

activity. Four days of burning activity resulted in 310 acres burned with enough ground fuels reduced

Whereas the fire was not as productive as many foresters would have liked, the potential and imminent danger of a catastrophic fire has been reduced in this area because of the thinning and burning

making this area less hazardous during the summer months.

Transects were established before thinning and will be reviewed during the growing season to identify plant diversity and to verify expectations of increased grass and forbes growth.

Although the project funding is complete, the project manager, Michael Lujan, expects to come back to this area in a couple of years to collect



Duane Archuleta working the fireline.

information on the transect survey, and when necessary, do further cool surface fire applications on this area. Duane Archuleta, the fire management officer, is looking at any open burn window, not only optimal burn times, to reduce fuel materials and improve surface vegetative growth on forests. This is a huge task, but one that will make a difference during the height of the summer when forests are at risk to fire whether by natural or manmade causes.

Prevention of wildfires, or crown fires by using management techniques such as thinning, prescribed harvesting, and surface fires can alleviate the risks, and protect investments in private property. In the past, prescribed burning as a management tool has been limited because of public attitudes and liability issues related to air quality and other factors. But cool surface fires will not kill a Ponderosa, in fact the bark will thicken in response to fire, which offers additional protection against insects and disease. Cool surface fires also lessen the need for use of manmade chemicals to reduce brush and insect infestations, and recycle nutrients.



Michael Lujan on fire duty.

FUTURE EVENTS

APRIL

12-14, The American Water Resources Association is holding a spring speciality conference "Agricultural Hydrology and Water Quality." A principal objective will be to address agricultural related water quality and hydrology concerns of regional, national, and international importance and bring together policy makers, researchers, commodity and environmental groups and citizens to discuss various environmental quality-related questions facing our society. The conference will be held in Kansas City, MO. For more information, log onto <<http://www.awra.org/meetings/Kansas2003/>>.

MAY

April 30-May 2, The New Mexico State University will be hosting "Aquatic Resources in Arid Lands Conference." This conference will bring together experts in sustainable water use, aquatic habitat management, and native species conservation. For more information, visit <http://leopold.nmsu.edu/dcowley/ARIAL_conference.htm>.

1-4, The American Wetlands Campaign is holding the 2003 American Wetlands Campaign Biennial Conference: "Bogs, Playas, Pools: Protect America's Unique Wetlands!" in Minneapolis, Minnesota. This year, the conference will include three tracks: education and outreach, wetland science, and wetland conservation policy. In addition to providing the latest information on wetland issues, participants will receive training to further their wetland conservation and education activities. For more information, visit <<http://www.iwla.org/sos/awm/conference/index.htm>>.

**NM Environment Department
Surface Water Quality Bureau
Watershed Protection Section
P.O. Box 26110, Runnels Bldg.
Santa Fe, New Mexico 87502**

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